

A Structural Equation Model of Knowledge Management Based On Organizational Climate in Universities

F. Nazem, M. Mozaiini, A. Seifi

Abstract—The purpose of the present study was to provide a structural model of knowledge management in universities based on organizational climate. The population of the research included all employees of Islamic Azad University (IAU). The sample consisted of 1590 employees selected using stratified and cluster random sampling method. The research instruments were two questionnaires which were administered in 78 IAU branches and education centers: Sallis and Jones's (2002) Knowledge Management Questionnaire ($\alpha=0.97$); and Latwin & Stringer's (1968) Organizational Climate Questionnaire ($\alpha=0.83$). The results of path analysis using LISREL software indicated that dimensions of organizational climate had a direct effect on knowledge management with the indices of 0.94. The model also showed that the factor of support in organizational climate had the highest direct effect on the knowledge management.

Keywords—Knowledge management, Organizational climate, Structural model, Universities.

I. INTRODUCTION AND PURPOSE OF THE STUDY

KNOWLEDGE has been identified as one of the most important resources that contribute to the competitive advantage of an organization [1]. Knowledge and generation of knowledge play important roles in a firm's economic performance [2]. Knowledge management is a set of professional practices to improve organizational effectiveness and enhance employee's willingness to share knowledge in the organization [2]. Many organizations have embarked upon knowledge management as a core strategy to enhance their organizational competitive advantage [2].

In their book entitled "Knowledge management in education" [5], Sallis & Jones offer a useful knowledge management self-assessment checklist with scoring elements such as:

- Vision and mission: It refers to having vision as a knowledge-based organization and sharing it with the stakeholders and the mission as the knowledge creator and translating it into practical strategies.
- Strategy: It refers to developing modeled scenarios and applying them in the management.
- Organizational culture: It refers to the different dimensions of culture including creating, centralizing,

sharing, and recognizing organizational culture as a key competence.

- Intellectual capital: It includes recognizing the value of intellectual assets and codifying its tacit knowledge.
- Learning organization: Under learning organization, it is mentioned that organization should create continuous learning, define skills to create new knowledge, recognize EQ and its influences, encourage creative thinking, and promote action learning both for individuals and teams.
- Leadership and management: In leadership and management, organizations are required to have senior-management support, have knowledge leaders and managers with appropriate leadership styles, and develop strategies for promoting middle-managers.
- Teamwork and learning communities: Regarding teamwork and learning communities, organizations should encourage learning communities and knowledge teams, establish trust, and recognize the need for intellectual autonomy.
- Sharing knowledge: It signifies that organizations ought to collect, record major organization events, and share new information, and understand competitors' knowledge management system.
- Knowledge creation: It requires the organizations to recognize new knowledge, those known as experts, and turn it into service.
- Digital sophistication for the organization: In terms of digital sophistication, organizations are to develop technologies among their employees by clear technological architecture, enhancing their knowledge, and devising virtual collaborative systems and/or communities [5].

Davis & Mentzer found out that negative organizational climates, characterized by weak leadership support and misaligned and reward structures, contributed to ineffective knowledge management [6]. According to French et al., the organizational climate of a collection has a direct and steady relation with the perception of the organization members about its cultural features. This perception affects the people's feeling, attitude, and behavior in their workplace [7]. Boulden also believes that the organizational climate is an environment in which people work, and it is a reflection of staff's attitude and the style of organization management [8]. According to Owens, the concepts of both organizational culture and organizational climate are structures which deal with the same

Fattah Nazem is with the Department of Education, Roudehen Branch, Islamic Azad University, Roudehen, Iran (corresponding author to provide e-mail: Nazem@Riau.Ac.ir).

Mina Mozaiini and Amir Seifi are with the Department of Education, Damavand Branch, Islamic Azad University, Damavand, Iran (e-mail: Mozaiinim@Yahoo.com, Seifi20_Amir@Yahoo.com).

fact, and the people's behavior in organizations is not the result of interaction with the direct and tangible event, but it is the result of interaction with the intangible powers in the environment [9].

Steers believes that if the organization goal is to achieve favorable feedback and performance, the climate which is tending toward success will be more suitable; however, if the organization wants to satisfy its staff, a friendly climate will mostly suit it [10].

After carrying out a lot of research in the field of organizational climate, Litwin and Stringer [11] compiled a fifty-item questionnaire which contain dimensions like structure, responsibility, reward, risk taking, warmth, support, conflict, standard, and identity which are explained as follows:

- Structure: The feeling that employees have about the constraints in the group, how many rules, regulations, procedures there are.
- Responsibility: The feeling of being your own boss; not having to double-check all your decisions; when you have a job to do, knowing that it is your job.
- Reward: The feeling of being rewarded for a job well done; emphasizing positive rewards rather than punishments; the perceived fairness of the pay and promotion policies.
- Risk Taking: The sense of riskiness and challenge in the job and in the organization; is there an emphasis on taking calculated risks, or is playing it safe the best way to operate.
- Warmth: The feeling of general good fellowship that prevails in the work group atmosphere; the emphasis on being well-liked; the prevalence of friendly and informal social groups.
- Support: The perceived helpfulness of the managers and other employees in the group; emphasis on mutual support from above and below.
- Standards: The perceived importance of implicit and explicit goals and performance standards; the emphasis on doing a good job; the challenge represented in personal and group goals.
- Conflict: The feeling that managers and other workers want to hear different opinions; the emphasis placed on getting problems out in the open, rather than smoothing them over or ignoring them.
- Identity: The feeling that you belong to a company and you are a vulnerable member of a working team; the importance placed on this kind of spirit [11].

Chen & Huang suggest that innovative and cooperative climate is positively related to social interaction and that social interaction is more favorable when the organizational structure is less formalized, more decentralized and integrated and that social interaction is positively related to knowledge management [12]. These empirical evidences, according to Chen and Huang, support the process-oriented view and indicate that social interaction plays the mediating role between organizational climate, organizational structure, and knowledge management. Another study by Chen et al. [13]

was concluded finding that innovative and supportive climates are positively related to knowledge management. They found out that when the organizational structure is less formalized, more decentralized, and integrated, knowledge management is more enhanced. Regarding the relationship between organizational climate and knowledge management, Janz & Prasarnphanich examined the relationships among organizational climate, cooperative learning, and created and disseminated knowledge and listed four dimensions of risk, reward, warmth, and support as the ones to assess organizational climate [14]. Zack hypothesizes that effective knowledge creation, sharing, and leveraging require an organizational climate and reward system that value and encourage cooperation, trust, learning, and innovation [15]. Lee et al. also underscore the role of organizational climate in higher knowledge management performance [16]. According to them, the critical managerial drivers influencing enhanced organizational climates were reward, top management support, and IT service quality. Besides all these studies, there is huge literature regarding the confirmation of the relationship between organizational climate along with its aspects and knowledge management [17]-[20].

II. RESEARCH QUESTIONS

1. What is the structural model of the knowledge management based on organizational climate in universities?
2. Which variables have the highest and the lowest effectiveness on the knowledge management?

III. DESIGN OF THE STUDY

The research design of this study includes library research to access the theoretical framework and the related literature; Survey method to collect, classify, describe, and analyze the data. The population under investigation in this study consisted of official staff members who work in 420 branches and educational centers in 14 zones of Islamic Azad University. In order to estimate the least volume of sample,

$$n = \frac{z^2 \sigma^2}{d^2}$$

formula was used. Regarding the minimum sample required for the staff group which was estimated as 1590, knowledge management and organizational climate questionnaires were administered to the staffs in 78 branches and educational centers. In order to select the research sample, two methods of stratified and cluster random sampling were used.

The research instruments were as follows: Sallis and Jones's Knowledge Management Questionnaire [5] which consist of 42 items with ten underlying constructs of vision and mission, strategy, organizational culture, intellectual capital, learning organization, leadership and management, teamwork and learning communities, sharing knowledge, knowledge creation and digital sophistication with the obtained index of Cronbach's Alpha of 0.97; and the Litwin & Stringer's Organizational Climate Questionnaire [11] which

consist of 50 items covering the dimensions of structure, responsibility, reward, support, risk taking, warmth, standard, conflict, and identity ($\alpha=0.83$). The results of the study were analyzed through path analysis using LISREL software.

IV. FINDINGS OF THE STUDY

The data collected from the administration of the instruments were analyzed. These data included the different indexes of central tendency, variability and the distribution of the questionnaires and its components. The distribution of the staff's scores in the given variab had tendency toward normality.

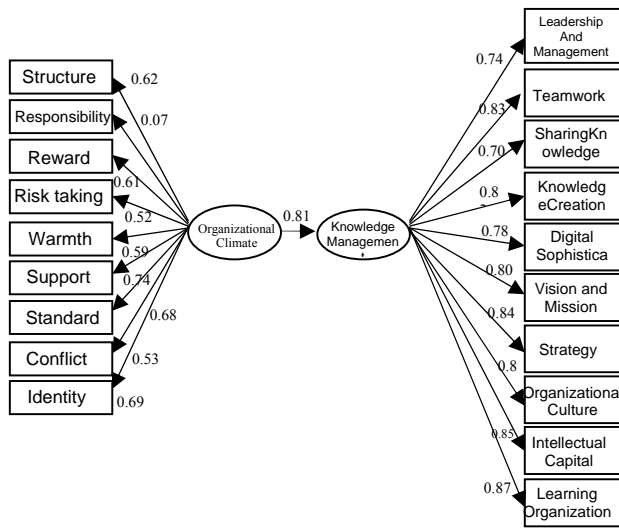


Fig. 1 Path analysis model for components of organizational climate with knowledge management

As shown in Fig. 1, the Lambda rate of external latent variable of organizational climate components was 0.62 for structure, 0.07 for responsibility, 0.61 for reward, 0.52 for risk taking, 0.59 for warmth, 0.74 for support, 0.68 for standard, 0.53 for conflict, and 0.69 for identity whose accumulation forms the organizational climate variable with the effectiveness rate of 0.64. It means that 64% of the variation in the dependent variable of knowledge management is explained by a collection of these indices. The variable of structure indicates the highest amount of internal consistency in the external latent variable.

The Lambda rate of internal latent variable of knowledge management components were 0.74 for leadership and management, 0.83 for teamwork and learning communities, 0.70 for sharing knowledge, 0.82 for knowledge creation, 0.78 for digital sophistication, 0.80 for vision and mission, 0.84 for strategy, 0.87 for organizational culture, 0.85 for intellectual capital, and 0.87 for learning organization whose accumulation forms the knowledge management variable. The variable of learning organization indicates the highest amount of internal consistency in the internal latent variable.

Since the model's goodness of fit index is 0.94, it can be stated that it has an acceptable fit. The calculated index

indicates the direct effect of organizational climate on knowledge management.

The following table presents the indices related to the model's fit:

TABLE I
 MODEL'S FIT INDICES

Index	Rate	Interpretation
Lewis-Tucker (Non-normed fit index)	0.92	High fit (more than 0.90)
Bentler-Bonett's (Normed fit index)	0.93	High fit (more than 0.90)
Hoelter	0.81	High fit (more than 0.70)
Root Mean Square Error (RMSE)	0.034	High fit (equal to or less than 0.05)
GFI	0.94	High fit (more than 0.90)

The six indices of goodness of fit indicate presented model's fit and empirical data. Therefore, desirability adaptation is provided for the designed model and empirical data and it can be approved as an appropriate model for the knowledge management.

V. DISCUSSION AND CONCLUSIONS

The results of path analysis method revealed that dimensions of organizational climate have positive impact on knowledge management. Pointing to organizational climate and the related factors in their knowledge management model, Lee et al. found out that there is a relationship between organizational climate and knowledge management [16]. They named reward and senior-management support as two of the most important factors in organizational climate. Durcikova et al. also revealed that organizational climate plays a key role in the successful operation of system in knowledge management [21]. Chen et al. concluded that innovative and supportive climates are positively related to knowledge management [13]. In their theoretical framework to investigate the impact of organizational climate on knowledge management, Davis & Mentzer also revealed that negative organizational climates, characterized by weak leadership support and misaligned and reward structures, contributed to ineffective knowledge management [6]. Chen and Huang suggested that innovative and cooperative climate is positively related to social interaction and that social interaction is more favorable when the organizational structure is less formalized, more decentralized and integrated and that social interaction is positively related to knowledge management [12]. References [17], and [18]-[20] show quite huge amount of literature devoted to find out the relationship between organizational climate along with its dimensions and knowledge management which all confirm the existence of such relationship.

Knowledge management is now widely recognized as a competitive advantage and an increasing number of organizations are incorporating the knowledge management strategy [5], [6]. Knowledge management has been a critical factor for organizations looking to increase their productivity and effectiveness [15], [3]. According to Koulopoulos and

Frappaolo, knowledge management is a critical business strategy which enables an organization to leverage its most precious resources, collective knowledge, talent and experiences to accelerate the rate at which it handles new market challenges and opportunities [22]. Inkpen propounds that organizations' failure to create and manage knowledge as a critical asset may account for their declining performance [23]. According to Wiig, knowledge management is fundamentally the management of corporate knowledge and intellectual assets that can improve a range of organizational performance characteristics and add value by enabling an enterprise to act intelligently [24].

Recent developments in the organizational knowledge literature [2] stress the importance of knowledge management to build a sustainable competitive advantage [6]. Lee underlines the significance of knowledge management in managing scientific bodies in higher education institutes [25].

According to the findings of different studies, it is recommended to form appropriate organizational atmosphere to improve knowledge management in universities. In other words, university atmosphere should be shaped in the following ways:

- There must be a sense of cooperation and collaboration among managers and employees in university.
- In organizational atmosphere, pay attention to humanity of employees and their feelings.
- Employees should be encouraged due to good performance and get reward for their efforts.
- The organization has to create a friendly atmosphere and relaxed and non-stressful environment.
- People who work in the organization should be proud of it, and faithful to goals of organization.
- There is a reasonable idea beyond performance criteria and employees feel satisfied when they have good performance.
- Managers encourage employees to comment in the meetings so openly and express their opinions, even those comments which seem to be opposite.
- People are encouraged to make the necessary changes to their work area.
- Management in the organization must determine an outline for subordinates and make them responsible for what they do.
- Jobs should be clearly defined and put in the structure logically.
- Policy options for decision-making are clearly explained.
- Inconvenient regulations must be minimal.
- New ideas increase productivity with proper planning and organization.

It is also suggested that the research projects as this one are to be endorsed in all branches of Islamic Azad University (IAU) to upgrade the knowledge management. With the effective role of higher education in the economic, social, political, and cultural development, it is suggested that this study can also be carried out in other universities in and out of

the country so as to practically take further steps in the field of knowledge management.

ACKNOWLEDGMENT

This paper is extracted from a research project sponsored by the research department of the Islamic Azad University, Roudehen Branch to whom we owe a debt of gratitude.

REFERENCES

- [1] J.D. Politis, "The relationship of various leadership styles to knowledge management, *Leadership & Organization Development Journal*," vol. 22, no. 8, pp. 354-364, 2001.
- [2] R. M. Grant, "Toward a knowledge-based theory of the firm," *Strategic Management Journal*, vol. 17, no. 2, pp. 109-22, 1996.
- [3] K. E. Sveiby, *The new organizational wealth: Managing and measuring knowledge-based assets*. San Francisco: Barrett-Koehler Publishers, 1997.
- [4] T. W. Brailford, "Building a knowledge community at Hallmark Cards," *Research Technology Management*, vol. 44, no. 5, pp. 18-25, 2001.
- [5] E. Sallis, and G. Jones, "Knowledge management in education", *London, Kogan page Limited*, 2002
- [6] D. F. Davis and J. T. Mentzer, "Organizational climate, knowledge management, and performance": *An integrative framework, American Marketing Association, Conference Proceedings, Chicago*, vol. 13 Pg.298, 2002.
- [7] W. L. French. F. E. Kast, and J. E. Rosenzweig, "Understanding Human Behavior in Organization". --- *Harper and Row* 1985.
- [8] G. P. Boulden, "Productivity Linked to Profitability: *The Basis for Improved Work Life. In Better Quality of Work Life through Productivity: International Productivity Congress*" (pp.69-70). Tokyo: Asian Productivity Organizations 1992.
- [9] R. G. Owens, "Organizational Behavior in Education". *4th Ed. Boston, MA: Allyn and Bacon*, 1991.
- [10] R. M. Steers, "Organizational effectiveness. A Behavioral View": *Santa Monica, CA: Good Year Publishing*, 1977.
- [11] G. H. Litwin, and R. A. Stringer, Jr., *Motivation and Organizational Climate*. USA: Harvard University Press, 1968.
- [12] C. J. Chen, and J. W. Huang, "How organizational climate and structure affect knowledge management, the social interaction perspective," *International Journal of Information Management*, vol. 27, no. 2, pp. 104, 2007.
- [13] C. J. Chen, J. W. Huang, and Y. C. Hsiao, "Knowledge management and innovativeness, the role of organizational climate and structure," *International Journal of Manpower*, vol. 31, no. 8, pp. 848, 2010.
- [14] B. D. Janz, and P. Prasamphanich, "Understanding the antecedents of effective knowledge management: the importance of a knowledge-centered culture," *Decision Sciences*, vol. 34, no. 2, pp. 351-384, 2003.
- [15] M. H. Zack, "Developing a knowledge strategy," *California Management Review*, vol. 40, no. 4, pp. 45-56, 1990.
- [16] J. H. Lee, Y. G., Kim, and M. Y. Kim, "Effects of managerial drivers and climate maturity on knowledge management performance: Empirical validation," *Information Resources Management Journal*, vol. 19, no. 3, pp. 48-60, 2006.
- [17] G. W. Bock, R. W. Zmud, Y. G. Kim, and J. N. Lee, "Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate," *MIS Quarterly*, vol. 29, no. 1, pp. 87-111, 2005.
- [18] J. S. Brown, and P. Duguid, "Organizing knowledge," *California Management Review*, vol. 40, no. 3, pp. 90-109, 1998.
- [19] D. A. Klein, "The strategic management of intellectual capital: An introduction," in *The Strategic Management of Intellectual Capital*, D. Klein, Ed. Boston: Butterworth-Heinenmann, 1998, pp. 1-19.
- [20] T. A. Peachey, "An examination of the effects of cultural, climate, structural, and technological factors on knowledge management effectiveness." [Ph.D. Dissertation]. *Auburn University*, 2006.
- [21] A. Durcikova, "The role of organizational climate in the use of knowledge management systems to support problem-solving," [Ph. D. Dissertation, Abstract]. University of Pittsburgh, 2004.
- [22] T. M. Kouloupoulos, and C. Frappaolo, *Smart things to know about knowledge management*. Oxford, U K: Capstone Publishing Limited, 2000.

- [23] A. C Inkpen, Creating knowledge through collaboration, California Management Review, 39(1), 123- 140H,1996.
- [24] K. Wigg, *Knowledge management foundations*, Vols. 1, 2 and 3. Texas: Schema Press, 1993.
- [25] Y. Lee, "Department chair's perceptions of knowledge management strategies in colleges of education: Measurement of performance by organizational factors," [Ph.D. Dissertation, Abstract]. *Northern Illinois University*, USA, 2007.

Fattah Nazem is an Associate Professor. He has been vice-president of the research department for the last five years. His research interests are in the field of Higher Education Management. He has written 2 books and 110 articles. He is Chief Executive of the Quarterly Journal of Educational Science.

Mina Mozaiini B.A. in Industrial Management, M.A. in Educational Administration, and Industrial Management (Finance), Visiting Professor at IAU for 5 years, Executive Director of Innovations of Educational Administration Quarterly.

Amir Seifi is B.Sc. in Software Engineering and M.A. in Educational Administration, visiting professor at IAU for 5 Years.